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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,945	01/30/2002	John C. Carrick	2376.2004-000	7237

21005 7590 03/20/2008
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EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2613	

MAIL DATE	DELIVERY MODE
03/20/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/060,945	CARRICK ET AL.	
	Examiner	**Art Unit**	
	DAVID S. KIM	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-19,21-40 and 42-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-19,21-40 and 42-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 December 2007* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Applicant's response to the objections to the drawings in the previous Office Action (mailed on 30 August 2007) is noted and appreciated. Drawings were received on 03 December 2007. All of these drawings, except one, are approved. Fig. 4A is disapproved:

In Fig. 4A, the apparatus of Fig. 4A corresponds to an embodiment that uses pilot tone receivers 430a and 430b, i.e., pilot tone receivers of the TITAN 6100 optical network (Applicant's specification, p. 10, l. 17-23). A feature of the standard TITAN 6100 pilot tone receiver is an ability to adjust its detection bandwidth (Applicant's specification, p. 10, l. 22-23). Applicant's pilot tone receiver allows the detection bandwidth to be made *narrow* (Applicant's specification, p. 10, l. 23-24). Note that this ability is *within the pilot tone receivers 430a and 430b.*

In contrast, another embodiment of Applicant's disclosure employs a narrow band *digital* filter to provide a narrow band filtered signal output (Applicant's specification, p. 22, l. 12-15). This digital filter use *a time to frequency transformation* (Applicant's specification, p. 22, l. 12-13), which corresponds to 431 in Fig. 4A filed by Applicant on 03 December 2007, employed *in processor 440* in Fig. 4A (Applicant's specification, p. 22, l. 2-4).

Thus, Fig. 4A filed by Applicant on 03 December 2007 discloses an embodiment with (1) narrow band filters in the pilot tone receivers 430 *and* (2) a narrow band digital filter in processor 440. However, Applicant's disclosure does not expressly disclose the use of (1) and (2) *together*, which corresponds to **new matter**. Rather, Applicant's disclosure expressly discloses the use of (1) *or* (2) (Applicant's specification, p. 22, l. 2-4).

As a remedy, Examiner respectfully suggests Applicant amend Fig. 4A so that the box of 431 is drawn with *dotted lines*, thus indicating its usage in an alternative embodiment.

Specification

2. Applicant's response to the objection to the specification in the previous Office Action (mailed 30 August 2007) is noted and appreciated. Applicant responded by amending the specification (filed on 03

December 2007). However, similar to the objection to Fig. 4A above, the disclosure is objected to for introducing **new matter**.

In particular, notice this presently amended portion of the specification:

> The pilot tone receivers 430 show single channel, single receiver repeatability of better than 0.1 dB optical, which implies an ability to sense angles to 0.0233 radians. This is due to the high signal-to-noise ratio available with narrow detection filters (not shown) in the processor 440. In an example embodiment, the narrow band digital filters in the processor may use a time to frequency transformation 431. For example, a forward Fourier transform may be used to convert time data to multiple narrow band filter outputs, one of which outputs is the desired narrow band filtered signal output. For fiber optic cables, the wavelength of pilot tones (not the optical carrier) is 136 to 272 meters with current pilot tone frequency assignments. This angle resolution translates to an ability to resolve distances of +/- 0.5 to 1.0 meter. With two receivers 430a and 430b operating simultaneously and doing relative measurements for this SFR, angle accuracy and range resolution are better than 0.5 meters. (emphasis Examiner's).

The underlined portions above are results of amendments to the specification. Applicant's original disclosure of this part of the specification discloses an embodiment with (1) narrow band filters *in the pilot tone receivers 430* (Applicant's original specification, p. 10, l. 22-25). The underlined portions above change this part of the specification so that it discloses an embodiment with (2) a narrow band *digital* filter *in processor 440*. However, Applicant's original disclosure does not disclose expressly disclose the use of (2) with the other components that were originally associated with the embodiment of (1). Accordingly, the underlined portions constitute **new matter**.

As a remedy, Examiner respectfully suggests Applicant to amend the specification in the following ways:

1) Revert the above portion of the specification to the original version, thus cancelling the new matter.

2) Move the reference to 431 in Fig. 4 to the corresponding portion of the specification on p. 22, l. 12-15.

Appropriate correction is required.

Claim Objections

3. **Claim 42** is objected to because of the following informalities:

In claim 42, -- claim 41 -- is used where -- claim 39 -- may be intended. Otherwise, claim 42 depends on cancelled claim 41.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 1-3, 5-19, 21, 22, 24-40, and 42-47** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong et al. (U.S. Patent No. 5,062,703, hereinafter "Wong") in view of Verhoof (EP 0 560 426 A1), Tomofuji et al. (U.S. Patent No. 5,383,046, hereinafter "Tomofuji"), So et al. ("Measuring chromatic dispersion and modal interference with an optical time-domain reflectometer", hereinafter "So"), and Akiyama et al. (U.S. Patent No. 5,982,530, hereinafter "Akiyama").

Regarding claim 1, Wong discloses:

A method for characterizing an optical transmission path in a network with network traffic, the method comprising:

modulating (col. 5, l. 3-18) an optical signal with a pilot tone and outputting the modulated optical signal onto the optical transmission path;

sweeping (col. 5, l. 6) the pilot tone across a frequency range;

detecting amplitudes and phases of the pilot tone along a forward path (e.g., forward path to DUT in Fig. 3) and a reflected path (e.g., reflected path from DUT in Fig. 3) of the optical transmission path;

determining dispersion in at least a portion of the optical transmission path (e.g., "dispersion" in col. 6, l. 4-7); and

characterizing the optical transmission path based on the detected amplitudes, phases (e.g., Figs. 5A-5B), and dispersion (e.g., determining the "dispersion" in col. 6, l. 4-7 would constitute additional characteristic information in the characterization of the optical transmission path).

Wong does not expressly disclose:

modulating a ***data traffic*** *optical signal* with a pilot tone and outputting the modulated optical signal onto the optical transmission path (emphasis Examiner's).

However, it is known to characterize an optical transmission path by modulating an optical signal with data ***and*** a pilot tone, as shown by Verhoof (information/data "TV" signal in Fig. 1 and measuring signal "MS" pilot tone in Fig. 1). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate the modulating step of Wong with data ***and*** a pilot tone, as discussed by Verhoof. One of ordinary skill in the art would have been motivated to do this to allow one to practice the method of Wong in-service so that normal signal transmission service to subscribers continues during the method (Verhoof, col. 1, l. 50-58; col. 2, l. 45-49).

Wong in view of Verhoof does not expressly disclose:

modulating a data traffic optical signal with a pilot tone and outputting the modulated optical signal onto the optical transmission path (emphasis Examiner's).

Rather, Verhoof shows the modulation of an optical signal with the combined modulating signal of a data traffic signal and a pilot tone (Verhoof, single modulating input to modulator 2 in Fig. 1). This is one known way to modulate an optical signal with a data traffic signal and a pilot tone. However, this kind of modulation is relatively well known in the art. Moreover, there are other known ways to provide this kind of modulation, as shown by Tomofuji (e.g., 8 in Fig. 4, 50 in Fig. 9, 66 in Fig. 13, 67 in Fig. 14, 75 in Fig. 19), including modulation of a data traffic optical signal with a pilot tone (Tomofuji, e.g., 8 in Fig. 4, 66 in Fig. 13). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement various ways to modulate an optical signal with a data traffic signal and a pilot tone, including modulation of a data traffic optical signal with a pilot tone. One of ordinary skill in the art

would have been motivated to do this to provide at least design flexibility. Moreover, notice that Applicant's own disclosure also discusses multiple ways to modulate an optical signal with a data traffic signal and a pilot tone (Applicant's specification, p. 9, l. 16-23, p. 18-19, bridging paragraph) without highlighting any particular way as a particularly inventive way of doing so. These multiple ways correspond closely to the ways shown in Verhoof and Tomofuji.

Wong in view of Verhoof and Tomofuji does not expressly disclose:

determining dispersion in at least a portion of the optical transmission path ***based on the detected amplitudes and phases.***

Rather, Wong broadly discloses determining dispersion (e.g., "dispersion" in col. 6, l. 4-7). It is known that there are various types of dispersion, such as chromatic dispersion and modal dispersion. The usage of a reflectometer to determine chromatic dispersion is known in the art, as exemplified by So (abstract, p. 2110-2111, section 2 Chromatic Dispersion). There is a variety of known ways to determine dispersion, and Akiyama also provides a suitable example (e.g., the principle of Fig. 16(B) according to the equation of col. 11, l. 5-13). For example, notice that Akiyama teaches that one may use the length value of an optical transmission path to determine the dispersion of that optical transmission path (col. 11, l. 5-13, col. 13, l. 24-25). Wong teaches the determination of the length value of an optical transmission line (col. 9, l. 51 – col. 10, l. 7, col. 10, l. 59-68) through the use of detected amplitude and phase information (col. 10, l. 64-68) of a swept pilot tone (modulation frequencies w_m of modulation source 20, col. 5, l. 4-6, col. 7, l. 11-13, are used in the length determination, e.g., col. 9, l. 58-65) along a forward path (e.g., "incident" in col. 8, l. 19-22, col. 10, l. 22) and a reflected path (e.g., "reflected" in col. 8, l. 19-22, col. 10, l. 22-23) of the optical transmission line. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement some kind of detailed way to provide the dispersion determination of Wong, e.g., the example of Akiyama. One of ordinary skill in the art would have been motivated to do this since Wong is relatively silent about how to actually implement its determination of dispersion. That is, So and Wong suitably speak into this silence with details for such an implementation. Moreover,

another motivation would be to extend the measurement capability of Wong to expressly include the measurement of chromatic dispersion (So, p. 2110, col. 2, end of 1st paragraph).

As described above, the prior art of record would disclose "determining dispersion in at least a portion of the optical transmission path ***based on the detected amplitudes and phases***" since the dispersion determination of Akiyama would be based on the length value of Wong, which would be based on the detected amplitudes and phases of Wong.

Regarding claim 2, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 1 wherein the characterizing includes determining at least one impairment (Wong, col. 6, l. 4-36) in the optical transmission path.

Regarding claim 3, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 2 wherein the optical transmission path is a fiber; and

the determining includes determining a disconnection, crimp, obstruction, defect, or assembly error (Wong, col. 6, l. 4-36).

Regarding claim 5, Wong in view of Verhoof, Tomofuji, So, and Akiyama does not expressly disclose:

The method as claimed in claim 1 further including automatically correcting the dispersion.

It is known that chromatic dispersion is a limiting parameter on transmission length and bit rate (So, p. 2110, col. 2, beginning of middle paragraph). Accordingly, the field is full of teachings for compensation of chromatic dispersion. Moreover, automatic correction of dispersion is a well-known technique in the art. For example, Akiyama teaches such automatic correction after the dispersion is measured (Akiyama, e.g., Figs. 21(A)-(B), 22(A)-(B), 24(A)-(B), 25(A)-(B), 26, 27(A)-(B)). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement some means for automatically correcting the dispersion detected by Wong in view of Verhoof, Tomofuji, So, and Akiyama. One of ordinary skill in the art would have been motivated to do this since dispersion can change with time (Akiyama, col. 2, l. 19-24). Automatic correction provides precise compensation

(Akiyama, e.g., col. 32, l. 5-13), which facilitates higher transmission speeds (Akiyama, col. 1, l.56-62; col. 32, l. 5-13).

Regarding claim 6, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 1 wherein the detecting is co-located (Wong, e.g., under one reading of "co-location", notice co-location of 16A and 16B in Figs. 2-3 within the bounds of a local area).

Regarding claim 7, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 1 wherein the detecting is non-co-located across a length of the optical transmission path having a known characteristic (Wong, e.g., under another reading of "co-location", notice that 16A and 16B are separate devices in separate locations, non-co-located).

Regarding claim 8, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 1 wherein the sweeping of the pilot tone maximizes the spatial resolution of the measurements (Wong, col. 11, l. 16-25).

Regarding claim 9, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 8 wherein the sweeping ranges between about 0.5 MHZ and about 2.5 MHZ (Wong, col. 5, l. 4-18 teaches a range that encompasses this range).

Regarding claim 10, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 1 wherein the sweeping includes selecting modulation frequencies essentially absent coherent modulations on the optical signal (Wong, the range of col. 5, l. 4-18 includes Applicant's range, which includes modulation frequencies that are essentially absent coherent modulations on the optical signal).

Regarding claim 11, Wong in view of Verhoof, Tomofuji, So, and Akiyama does not expressly disclose:

The method as claimed in claim 1 wherein the detecting of the pilot tone includes filtering the detected optical signal with a bandwidth sufficiently narrow to reject noise while preserving the pilot tone in a manner supporting accuracy requirements.

However, it is known to practice frequency domain reflectometry methods in environments that would employ such filtering. For example, Verhoof teaches the use of frequency domain reflectometry in

optical fiber networks. In particular, notice that the reflectometer operates in-service, i.e., during normal signal transmissions (col. 1, l. 50-58). Accordingly, the reflected signal will include the pilot tone and additional spectral components from the normal signal transmissions. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to filter the detected optical signal as claimed above. One of ordinary skill in the art would have been motivated to do this to filter out the additional spectral components from the normal signal transmissions, which could interfere with the detection and processing of the desired reflected pilot tone.

Regarding claim 12, Wong in view of Verhoof, Tomofuji, So, and Akiyama teaches a resolution of 1 Hz (Wong, col. 5, l. 5).

Regarding claim 13, Wong in view of Verhoof, Tomofuji, So, and Akiyama teaches filtering through computation (Wong, col. 6, l. 46-59), which implies filtering through a digital processor. Such digital processor filters are known to be adaptable.

Regarding claim 14, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 1 wherein the characterizing is based on a relative measurement of amplitudes and phases (Wong, note the comparison of the amplitudes and phases in 24 of Fig. 3).

Regarding claim 15, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 1 wherein the optical transmission path is a fiber (Wong, col. 4, l. 66).

Regarding claim 16, Wong in view of Verhoof, Tomofuji, So, and Akiyama does not expressly disclose:

The method as claimed in claim 1 used in a wavelength division multiplexed or time division multiplexed system.

However, wavelength division multiplexing and time division multiplexing are extremely well known techniques commonly applied in optical fiber networks. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement either or both of these techniques in the method of Wong in view of Verhoof, Tomofuji, So, and Akiyama. One of ordinary skill in the art

would have been motivated to do this since these techniques are common ways to increase the number of communication channels, which increases the amount of traffic that is transmitted through the network.

Regarding claim 17, claim 17 is an apparatus claim that corresponds largely to the method claim 1. Therefore, the recited steps in method claim 1 read on the corresponding means in apparatus claim 17. Claim 17 also includes limitations absent from claim 1. Wong in view of Verhoof, Tomofuji, So, and Akiyama also discloses these limitations:

the optical transmission path carrying network traffic (Verhoof, col. 1, l. 50-58).

Regarding claims 18-19 and 21, claims 18, 19, and 21 are apparatus claims that introduce limitations that correspond to the limitations introduced by method claims 2, 3, and 5, respectively. Therefore, the recited steps in method claims 2-3 and 5 read on the corresponding means in apparatus claims 18-19 and 21.

Regarding claim 22, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The apparatus as claimed in claim 17 wherein the detection unit includes at least one optical detector (Wong, e.g., 16A or 16B in Fig. 3) that senses the pilot tone and provides a corresponding electrical signal.

Regarding claim 24, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The apparatus as claimed in claim 22 further including at least one receiver coupled to each optical detector to convert the electrical signal to digital data (Wong, implied by "digital signal processing" in col. 5, l. 62-64).

Regarding claim 25, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The apparatus as claimed in claim 24 wherein the processing unit employs a frequency to time transformation to assist in characterizing the optical transmission path (Wong, Figs. 5A-5B).

Regarding claim 26, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The apparatus as claimed in claim 24 wherein the processing unit executes a time-to-frequency transformation to assist in characterizing the optical transmission path (e.g., Wong, col. 6 l. 56 and col. 10, l. 61, a "Fourier transform" is a time-to-frequency transformation).

Regarding claims 27-36, claims 27, 28, 29, 30, 31, 32, 33, 34, 35, and 36 are apparatus claims that introduce limitations that correspond to the limitations introduced by method claims 6, 7, 8, 9, 10, 11, 12, 13, 14, and 16, respectively. Therefore, the recited steps in method claims 6-14 and 16 read on the corresponding means in apparatus claims 27-36.

Regarding claim 37, claim 37 is an apparatus claim that introduces limitations that correspond to the limitations introduced by apparatus claim 17. Therefore, the recited means in apparatus claim 17 read on the corresponding means in apparatus claim 37.

Regarding claim 38, claim 38 is a computer-readable medium claim that introduces limitations that correspond to the limitations introduced by apparatus claim 17. Therefore, the recited means in apparatus claim 17 read on the corresponding steps in computer-readable medium claim 38.

Regarding claims 39-40 and 42-45, claims 39, 40, 42, 43, 44, and 45 are system claims that introduce limitations that correspond to the limitations introduced by claims 17, 18, 21, 31, 15, and 36, respectively. Therefore, the recited limitations in claims 15, 17-18, 21, 31, and 36 read on the corresponding means in system claims 39-40 and 42-45.

Regarding claim 46, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The method as claimed in claim 1 wherein the modulating includes modulating the amplitude of the data traffic optical signal at about 4% of a total amplitude of the optical signal (Tomofuji, "about 4%" is within the scope of "several percent" known and practiced in the art, col. 1, l. 41, col. 2, l. 14).

Regarding claim 47, claim 47 is an apparatus claim that introduces limitations that correspond to the limitations introduced by method claim 46. Therefore, the recited steps in method claim 46 read on the corresponding means in apparatus claim 47.

7. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Verhoof, Tomofuji, So, and Akiyama, as applied to claim 22 above, and further in view of Lemus et al. (U.S. Patent No. 6,111,676, hereinafter "Lemus").

Regarding claim 23, Wong in view of Verhoof, Tomofuji, So, and Akiyama discloses:

The apparatus as claimed in claim 22 further including a dual coupler (Wong, e.g., 26 in Fig. 3) coupled to the optical transmission path and connected to each optical detector, wherein the dual coupler

provides between about 2% and 5% (known in the art, as shown by Lemus, col. 4, l. 16-19) of the optical signal to the at least one optical detector.

<u>Response to Arguments</u>

8. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. Notice the application of teachings from So and Akiyama and the expanded treatment of claim 1.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID S. KIM whose telephone number is (571)272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. S. K./
Examiner, Art Unit 2613

/Kenneth N Vanderpuye/
Supervisory Patent Examiner, Art Unit 2613